



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,093	03/02/2004	Robert Scott Winsor	0918.0269C	1178
27896	7590	10/05/2005	EXAMINER	
EDELL, SHAPIRO & FINNAN, LLC 1901 RESEARCH BOULEVARD SUITE 400 ROCKVILLE, MD 20850				WANG, QUAN ZHEN
ART UNIT		PAPER NUMBER		
				2633

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/790,093	WINSOR, ROBERT SCOTT	
	Examiner Quan-Zhen Wang	Art Unit 2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 17 August 2005.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1 and 3-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1 and 3-46 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All
  - b) Some
  - c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____.
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3-10, 12-17, 19-31, 33-38, 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doucet et al. (U.S. Patent US 5,786,923) in view of Liou (U.S. Patent US 5,623.363).

Regarding claims 1 and 24 Doucet teaches a method for light transmit across a free space (fig. 1, 100), the method comprising: generate a substantially phase incoherent beam of light (column 4, lines 52-56); collimating the phase incoherent beam of light (fig. 8, optical antenna 710); and propagating the phase incoherent collimated beam of light across the free space (fig. 8, to/from optical router unit). The system of Doucet differs from the claimed invention in that Doucet does not specifically teach that the light source for the incoherent light beam is a LED coupled to a single mode fiber. However, it is well known in the art to generate incoherent light beam using a LED coupled to a single mode fiber. For example, Liou discloses a light source comprising a LED coupled to a single mode fiber (fig. 1; column 2, lines 66-67 and column 3, line 1). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a LED coupled to a single mode fiber, as it

is taught by Liou, into the system of Doucet as the light source in order to provide phase incoherent light beam.

Regarding claims 3-10 and 25-31, the system of Doucet differs from the claimed invention in that Doucet does not specifically teach that the system includes various claimed methods of generating incoherent beams of lights. However, the examiner takes Official Notice that the methods of generating incoherent beams of lights in claims 3-10 and 25-31 are well known light generating methods in the art. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate any of the methods in claims 3-10 and 25-31 into the system of the Doucet as the light source of the system, wherein the claimed differences involved to the substitution of interchangeable or replaceable equivalents and the reason for the selection of one equivalent for another was not to solve an existent problem, such substitution has been judicially determined to have been obvious. *In re Ruff*, 118, USPQ, 343 (CCPA 1958).

Regarding claims 12 and 33, Doucet further teaches that the system includes collimating the beam of light with one of a conventional optical mirror (fig. 8, optical antenna 710).

Regarding claim 13, Doucet further teaches focusing the beam of light onto a primary focal plane of a telescope (fig. 8, lens 780).

Regarding claim 14, Doucet further teaches directing the optical beam towards an optical receiver using active pointing techniques (fig. 8, active optical control system 760).

Regarding claims 15 and 36, Doucet further teaches directing the optical beam towards an optical receiver using static pointing techniques (column 17, lines 39-48).

Regarding claims 16-17, and 37-38, Doucet further teaches to modulate the phase incoherent beam of light to encode data upon the beam of light (fig. 8, beam modulator 752).

Regarding claims 19, and 40, Doucet further teaches to modulate WDM channels within the beam of light (column 8, lines 13-20).

Regarding claim 20, Doucet further teaches to receive the incoherent beam from free space (fig. 8, signals to/from optical router).

Regarding claim 21, Doucet further teaches tracking the receiving beam of light using active pointing and tracking techniques (column 17, lines 49-54).

Regarding claims 22-23, Doucet further teaches to detect one of light and darkness within the received beam of light (inherent), thereby to produce a received data stream and demodulate the received data stream (fig. 8, Beam demodulator 772 and receiver 770).

Regarding claim 34, Doucet further teaches that the propagating optics is a telescope (fig. 8, optical antenna 710).

Regarding claim 35, Doucet further teaches that the propagating optics further includes an active pointing and tracking module to control the direction in which the incoherent beam is propagated (fig. 8, beam alignment detector 762 and active optics control system 760).

Regarding claim 41, Doucet teaches an apparatus (fig. 8) for receiving a collimated phase incoherent beam (column 4, lines 52-56) of light from a free space (fig. 8, signal from optical router), comprising: a receiving lens (fig. 8, lens 780) to receive the collimated phase incoherent beam (fig. 8, beam 140/150 to the optical antenna 710) from free space; and a light detector to detect (fig. 8, beam demodulator 772; column 19, lines 62-64) at least one of light and darkness within the received phase incoherent beam of light, thereby producing a received data stream (column 19, lines 52-64).

Regarding claim 42, Doucet further teaches that the system comprising a demodulating module to demodulate the received data stream (fig. 8, beam demodulator 772).

Regarding claim 43, Doucet further teaches that the propagating optics further includes an active pointing and tracking module to control the direction in which the incoherent beam is propagated (fig. 8, beam alignment detector 762 and active optics control system 760).

3. Claims 11 and 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doucet et al. (U.S. Patent US 5,786,923) in view of Liou (U.S. Patent US 5,623.363) and further in view of Meadows (U.S. Patent US 5,381,250).

Regarding claims 11 and 32, the system of Doucet and Liou differs from the claimed invention in that Doucet and Liou do not specifically teach that the system includes collimating the beam of light with a gradient index lens. However, a gradient index lens is well known in the art, and using a gradient index lens to collimate a beam

of light is also well known in the art. For example, Meadows discloses to collimate a light beam using a gradient index lens (column 3, lines 47-55). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to use a gradient index lens to collimate the beam of light, as it is taught by Meadows, in the system of Doucet and Liou in order to direct the beam of light to a receiver with sufficient light intensity.

4. Claims 18 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doucet et al. (U.S. Patent US 5,786,923) in view of Liou (U.S. Patent US 5,623,363) and further in view of Yonenaga et al. (U.S. Patent US 5,543,952).

Regarding claims 18 and 39, the system of Doucet and Liou differs from the claimed invention in that Doucet and Liou do not specifically teach to use an interferometer to toggle the light beam to at least one of on and off. However, it is well known in the art to toggle (modulate) the light beam using an interferometer. For example, Yonenaga discloses to modulate the intensity of the light beam to one of on and off using an interferometer (column 3, lines 52-67 and column 4, lines 1-2). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to use an interferometer to toggle (modulate) the intensity of the light beam to at least one of on and off, as it is taught by Yonenaga, in the system of Doucet and Liou in order to encode the light beam.

5. Claims 44- 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doucet et al. (U.S. Patent US 5,786,923) in view of Liou (U.S. Patent US 5,623.363) and further in view of Huggins (U.S. Patent US 4,799,797).

Regarding claim 44, Doucet teaches a transmitter for use in an optical light beam data link capable of transmitting a beam of light across a free space, comprising: a light source to generate a substantially phase incoherent beam of light (column 4, lines 52-56); a modulator to encode data upon the phase incoherent beam of light (fig. 8, beam modulator 752); a collimator (fig. 8, optical antenna 710) to collimate the incoherent beam of light. The system of Doucet differs from the claimed invention in that Doucet does not specifically teach that the light source for the incoherent light beam is a LED coupled to a single mode fiber. However, it is well known in the art to generate incoherent light beam using a LED coupled to a single mode fiber. For example, Liou discloses a light source comprising a LED coupled to a single mode fiber (fig. 1; column 2, lines 66-67 and column 3, line 1). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a LED coupled to a single mode fiber, as it is taught by Liou, into the system of Doucet as the light source in order to provide phase incoherent light beam. The system of Doucet and Liou differs from the claimed invention in that Doucet and Liou do not specifically teach that the light source is a fiber-optic coupled superluminescent light emitting diode. However, a fiber-optic coupled superluminescent light emitting diode is a well-known optical source in the art. For example, Huggins used a fiber-optic coupled superluminescent light emitting diode (fig. 7, SLD 170) as the light source for the

multiplexed optical sensor system. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to use a fiber-optic coupled superluminescent light emitting diode, as it is taught by Huggins, as the light source in the system of Doucet and Liou in order to generate wavelength stable light beam for the communication system.

Regarding claim 45, Doucet further teaches that the system comprising a propagating optics to propagate the phase incoherent collimated beam of light across the free space (fig. 8, optical antenna 710).

Regarding claim 46, Doucet further teaches that the propagating optics further includes an active pointing and tracking module to control the direction in which the incoherent beam is propagated (fig. 8, beam alignment detector 762 and active optics control system 760).

#### ***Response to Arguments***

6. Applicant's arguments filed 8/17/2005 have been fully considered but they are not persuasive.

Applicant argues that the claimed invention includes a "single mode phase incoherent beam of light with a light emitting diode". However, a single mode fiber couple light emitting diode is well known in the art. For example, Liou (U.S. Patent US 5,623,363) discloses a single mode fiber couple LED light source in 1995. Even the Applicants admitted that "single mode optical-fiber-coupled superluminescent LEDs

(SLEDs) have recently been developed ..." (the instant specification, page 6, lines 17-19).

In response to applicant's argument that "propagating the phase incoherent collimated beam of light across the free space for long range communications transmission", a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. For the instant application, the combination of Doucet and Liou teaches every limitation of the structures of the claimed inventions.

As to claims 11 and 32, it is well known in the art "to collimate a light beam using a gradient index lens". As an example, Meadows is cited to show that collimating a light beam using a gradient index lens (column 3, lines 47-55) is well known. The combination of Doucet, Liou, and Meadows teaches every limitation of the claimed invention.

As to claims 18 and 39, it is well known in the art to toggle (modulate) the light beam using an interferometer. As an example, Yonenaga is cited to show the modulating the intensity of the light beam to one of on and off using an interferometer. The combination of Doucet, Liou, and Yonenaga teaches every limitation of the claimed invention.

Regarding claims 44-46, as it has been discussed above, "propagating the phase incoherent collimated beam of light across the free space for long range communications

transmission" is a recitation of the intended use of the claimed invention. It must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In addition, using a superluminescent LED is well known in the art. Even the Applicant admitted that "single mode optical-fiber-coupled superluminescent LEDs (SLEDs) have recently been developed, ..." (instant specification, page 6, lines 17-19). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to use the well known "single mode optical-fiber-coupled superluminescent LEDs" in the system of Doucet to transmit optical information.

### ***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Swanson et al. (U.S. Patent US 5.062.150) teach a fiber-based free-space optical system using both coherent and incoherent optical system. Milano et al. (U.S. Patent US 5,870,215) disclose a compact infrared identification and communication assembly using incoherent infrared light.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (571) 272-3114. The examiner can normally be reached on 9:00 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

qzw  
9/22/2005

*m.r. Sedighian*  
M. R. SEDIGHIAN  
PRIMARY EXAMINER